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IEEE Standard for Hydraulic Turbine and Generator Integrally Forged Shaft Coupling and Shaft Runout Tolerances

Sponsor

Power Generation Committee
of the
IEEE Power Engineering Society

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Foreword

(This Foreword is not a part of ANSI/IEEE Std 810-1987, IEEE Standard for Hydraulic Turbine and Generator Integrally Forged Shaft Couplings and Shaft Runout Tolerances.)

This standard details dimensions of integrally flanged shafts and couplings, such as are used for the connection between the generator and turbine in hydroelectric installations. It was originally developed by the American Society of Mechanical Engineers (ASME) in 1928 and approved for publication by the American Standards Association (ASA) in 1932. A revised version, sponsored by ASME, was approved by ASA in 1947 and identified as Standard B49.1.

Starting in 1953 the National Electrical Manufacturers Association (NEMA) undertook the sponsorship of the standard and a revised issue was approved in 1967 by the United States of America Standards Institute (USA Standards Institute superseded the ASA in 1966).

NEMA elected to withdraw their sponsorship of Standard B49.1 in 1985, and in 1985 the Institute of Electrical and Electronics Engineers (IEEE) agreed to sponsor it. The Hydroelectric Power Sub-committee of the IEEE Power Generation Committee undertook the task of reviewing, revising, and reissuing the standard.

NEMA also sponsored Standards MG 5.1, Large Hydraulic-Turbine-Driven Synchronous Generators and Reversible Synchronous Generator/Motor Units for Pumped Storage Installations and MG 5.2, Installation of Vertical Hydraulic-Turbine-Driven Generators and Reversible Generator/Motors for Pumped Storage Installations. Both of these standards contained tables concerning the "Allowable Runout Tolerance." Since MG 5.1 (rescinded in 1982) and MG 5.2 (rescinded in 1983) have been withdrawn by NEMA, these tolerance data have been included in this standard.

The working group wishes to acknowledge the contributions made to the standard by R. D. Handel and D. H. Hohnstein.

At the time this standard was approved, the members of the Working Group were as follows:

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D. H. Thomas

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IEEE Standard for Hydraulic Turbine and Generator Integrally Forged Shaft Couplings and Shaft Runout Tolerances

1. Introduction and Scope

This standard applies to the dimensions of integrally forged shaft couplings and to the shaft runout tolerances. Shafts and couplings included in this standard are used for both horizontal and vertical connections between generators and turbines in hydroelectric installations.

This standard does not include data on fabricated shafts, shaft stresses, and bolt tensioning. Industry experience suggests that the torque capacity of shafts having diameters greater than 72 inches is usually better provided by fabricated rather than forged shafts.

2. References

The following publications shall be used in conjunction with this standard:

[1] ANSI B18.2.1-1981, American National Standard Square and Hex Bolts and Screws, Inch Series.[1]

[2] ANSI B18.2.2-1972, American National Standard Square and Hex Nuts.

[3] ANSI C50.10-1977, American National Standard Requirements for Synchronous Machines.

[4] ANSI C50.12-1981, American National Standard Requirements for Salient Pole Synchronous Generators and Generator/Motors for Hydraulic Turbine Applications.

[1]ANSI publications can be obtained from the Sales Department. American National Standards Institute, 1430 Broadway, New York, NY 10018.